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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
GUPTA, ANISH	

ART UNIT	PAPER NUMBER
1654	

NOTIFICATION DATE	DELIVERY MODE
01/08/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/518,383	SANSON ET AL.	
	Examiner	Art Unit	
	ANISH GUPTA	1654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 October 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,2 and 4-61* is/are pending in the application.

4a) Of the above claim(s) *10-14,17 and 18* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-2, 6-7, 15, 16, 19-35, 40-61* is/are rejected.

7)☐ Claim(s) *4-9 and 36-39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-9, 15-16, and 19-61 in the reply filed on 2-11-08 is acknowledged. The requirement is still deemed proper and is therefore made FINAL.

Applicants also elected the species of SEQ ID NO 1, without any labels. A search was done for SEQ ID NO 1, and it was found to be free of the prior art. Search was extended to SEQ ID NO 2-14 and they too were found to be free of the prior art. In accordance Markush practice, the search was extended to the peptide of SEQ ID 15 of claim 1. This too was free of the prior art. Thus claims 1-9, 15-16 and 19-61 have been examined.

Claims 10-14, 17-18 have been withdrawn from consideration as corresponding to non elected Group.

2. All rejections and objections made in the previous office action and not cited herein are hereby withdrawn.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-3, 6-7, 15-16, and 19-35 and 40-61 remain rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to

one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The MPEP states that the purpose of the written description requirement is to ensure that the inventor had possession, as of the filing date of the application, of the specific subject matter later claimed by him. The courts have stated:

> "To fulfill the written description requirement, a patent specification must describe an invention and do so in sufficient detail that one skilled in the art can clearly conclude that "the inventor invented the claimed invention." Lockwood v. American Airlines, Inc., 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (1997); In re Gosteli, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989) (" [T]he description must clearly allow persons of ordinary skill in the art to recognize that [the inventor] invented what is claimed."). Thus, an applicant complies with the written description requirement "by describing the invention, with all its claimed limitations, not that which makes it obvious," and by using "such descriptive means as words, structures, figures, diagrams, formulas, etc., that set forth the claimed invention." Lockwood, 107 F.3d at 1572, 41 USPQ2d at 1966." Regents of the University of California v. Eli Lilly & Co., 43 USPQ2d 1398.

The MPEP lists factors that can be used to determine if sufficient evidence of possession has been furnished in the disclosure of the Application. These include "level of skill and knowledge in the art, partial structure, physical and/or chemical properties, functional characteristics alone or coupled with a known or disclosed correlation between structure and function, and the method of making the claimed invention. Disclosure of any combination of such identifying characteristics that distinguish the claimed invention from other materials and would lead one of skill in the art to the conclusion that the applicant was in possession of the claimed species is sufficient." MPEP 2163.

Further, for a broad generic claim, the specification must provide adequate written description to identify the genus of the claim. In Regents of the University of California v. Eli Lilly & Co., the court stated:

> "A written description of an invention involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as by structure, formula, [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials. Fiers, 984 F.2d at 1171, 25 USPQ2d at 1606; In re Smythe, 480 F.2d 1376, 1383, 178

> USPQ 279, 284-85 (CCPA 1973) ("In other cases, particularly but not necessarily, chemical cases, where there is unpredictability in performance of certain species or subcombinations other than those specifically enumerated, one skilled in the art may be found not to have been placed in possession of a genus. . . ."). Regents of the University of California v. Eli Lilly & Co., 43 USPQ2d 1398.

The MPEP further states that if a biomolecule is described only by a functional characteristic, without any disclosed correlation between function and structure of the sequence, it is "not sufficient characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence." MPEP 2163. The MPEP does state that for generic claim the genus can be adequately described if the disclosure presents a sufficient number of representative species that encompass the genus. MPEP 2163. If the genus has a substantial variance, the disclosure must describe a sufficient variety of species to reflect the variation within that genus. See MPEP 2163. Although the MPEP does not define what constitute a sufficient number of representative, the Courts have indicated what do not constitute a representative number species to adequately describe a broad generic. In Gostelli, the Court determined that the disclosure of two chemical compounds within a subgenus did not describe that subgenus. In re Gostelli, 872 F.2d at 1012, 10 USPQ2d at 1618.

In the instant case, the claims are drawn to a peptide that consists of SEQ ID 15. The peptide of SEQ ID 15 is a broad markush which is defined by the presence of variable J, Z, U, X, B. While the claims define specific substitutions for Z, U, X, B, the claim defines J as any amino acid so long as 50% of the J residues are polar amino acids. This disclosure does not provide ample written description since the claims do not identify a common structure or core that attributes its function. The J variables comprise 43 positions within the 75 amino acid claimed. Of the 43, twenty two residues are selected from arg, asn, asp, cys, gln, glu, gly his, lys, orn, pro, ser, thr, tyr. The claims do not identify which of the 47 J variables should be one these amino acids. Since the J variables comprise nearly 63% of the sequence and there is no specificity to any of the J variables, the claims lack relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties,

by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics. Note that the presence of static amino acids in position 13, 16, 17 etc. do not provide an identifiable core which would be apparent to one of ordinary skill in the art that this core is responsible for the function of the peptide.

As stated earlier, the MPEP states that written description for a genus can be achieved by a representative number of species within a broad generic. It is unquestionable claim 1 is a broad generic with respect all possible peptides encompassed by the claims. Even though 50% of the J variables are identified by a Markush, it is unclear which of the J variables are required to be polar residues and which J residues can be any amino acid. Furhtermore, the U variable, which is located in 12 positions, also contains a markush of ten amino acids. Given the breath of J and U, the peptides encompassed by the claims are numerous. For example allowing 20 J's to be any naturally amino acids, the claim would allow for 1.04×10^{26} different possibilities. Note that the definition of J is even broader since J allows for amino acid derivatives, whatever they might be. Even for U variables, and only using those listed within the claims, the number of peptides encompassed is 61917364224. The specification, however, provides for 14 specific sequences encompassed by the claims. It should be noted that many of these sequences contain a common motif and share significant homology. As a further illustration, attention is direct to claim 3, which defines the U variables. While the base claim lists 10 possibilities for U variables, claim 3 is limited to a hand full of amino acids. None of the examples recited contain a cysteine. Furthermore, some of the U variables are static to a specific amino acid. While SEQ ID 11-14 allow for some structural variations, majority of the sequence is defined and shares a common core. The 10 specific amino acid sequence disclosed and the four sequence with minor modifications are not representative of large number of peptides encompassed by the claims. Again, the peptides encompassed by the claims are in excess of greater than 1.04×10^{26}. It must not be forgotten that the MPEP states that if a biomolecule is described only by a functional characteristic, without any disclosed correlation

between function and structure of the sequence, it is "not sufficient characteristic for written description purposes, even when accompanied by a method of obtaining the claimed sequence." MPEP 2163. Here, though the claims may recite some functional characteristics, the claims lack written description because there is no disclosure of a correlation between function and structure of the compounds beyond compounds disclosed in the examples in the specification. Moreover, the specification lack sufficient variety of species to reflect this variance in the genus since the specification does not provide any examples of derivatives. The specification is void of any peptides that have modified amino acids and could be quantified as derivatives. The specification is limited to the above mention peptides that share a significant homology to one another. The description requirement of the patent statute requires a description of an invention, not an indication of a result that one might achieve if one made that invention. See In re Wilder, 736 F.2d 1516, 1521, 222 USPQ 369, 372-73 (Fed. Cir. 1984) (affirming rejection because the specification does "little more than outlin[e] goals appellants hope the claimed invention achieves and the problems the invention will hopefully ameliorate."). Accordingly, it is deemed that the specification fails to provide adequate written description for the genus of the claims and does not reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the entire scope of the claimed invention.

Response to Arguments

Applicants argue that that the claims have been restricted so that nearly 50% of the amino acids are clearly identified. The specification identifies the positions that are important for folding and/or activity. The stability and more generally the thermodynamic properties of the claimed peptides depend on the hydrophobic core domain the residues which are the residues U and B listed in table 1. For surface residues of the claimed peptide according to the invention, other than those

mentioned, there is a certain freedom of choice. Therefore, the peptide of the claimed invention can solve the technical problem of the present invention.

Applicants arguments have been fully considered but have not been found persuasive.

The claimed invention for variable J recites that 50% of the amino acid are polar residues selected from the group consisting of Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Lys, Orn, Pro, Ser, Thr and Tyr. While the claims do not specifically state what the other 50% of J variables comprise, it is assumed for the rejection that other 50% of J can be any amino acid. With that in mind, the claims recites a total of 43 J variables with 50% of them being Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Lys, Orn, Pro, Ser, Thr and Tyr. While these polar residues have been identified, the claims do not recite the position where these polar residues belong. In their response, Applicants argue that the J "residues are arranged spatially such that they are partially or completely exposed to the solvent." However, the specification does not identify how the residues are arranged spatially such that they are partially or completely exposed to the solvent. Since the J variables comprise nearly 63% of the sequence and there is no specificity to any of the J variables, the claims lack relevant, identifying characteristics, i.e., structure or other physical and/or chemical properties, by functional characteristics coupled with a known or disclosed correlation between function and structure, or by a combination of such identifying characteristics. Note that the presence of static amino acids in position 13, 16, 17 etc. do not provide an identifiable core which would be apparent to one of ordinary skill in the art that this core is responsible for the function of the peptide.

Recently in Ex Parte Kubin ,83 USPQ2d 1410 (Bd. Pat. App. & Int. 2007), Board of Patent Appeals and Interferences, found lack of written description in a claim drawn to a genus of polynucleotides encoding polypeptides "at least 80% identical to amino acids 22-221 of SEQ ID NO:2" The Board stated:

"Claim 73 is to a genus of polynucleotides encoding polypeptides "at least 80% identical to

amino acids 22-221 of SEQ ID NO:2" which bind to CD48. Sufficient description to show possession of such a genus "may be achieved by means of a recitation of a representative number of cDNAs, defined by nucleotide sequence, falling within the scope of the genus or of a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus." *Eli Lilly*, 119 F.3d at 1568, 43 USPQ2d at 1406. Possession may not be shown by merely describing how to obtain possession of members of the claimed genus or how to identify their common structural features. *See University of Rochester*, 358 F.3d at 927, 69 USPQ2d at 1895.

In this case, Appellants have sequenced two nucleic acids falling within the scope of claim 73 and three fusion proteins whose nucleotide sequences would fall within the scope of claim 73. None of these sequences varies amino acids 22-221 of NAIL, and thus these sequences are not representative of the genus.

Appellants also have described how to make and test other sequences within claim 73 sufficiently to satisfy the enablement requirement. **However, they have not described what domains of those sequences are correlated with the required binding to CD48, and thus have not described which of NAIL's amino acids can be varied and still maintain binding. Thus, under *Lilly* and its progeny, their Specification would not have shown possession of a sufficient number of sequences falling within their potentially large genus to establish possession of their claimed genus**. *Cf. Enzo*, 323 F.3d at 964, 63 USPQ2d at 1612 ("if the functional characteristic of … binding to [CD48] were coupled with a disclosed correlation between that function and a structure that is sufficiently known or disclosed," the written description requirement may be met).

Without a correlation between structure and function, the claim does little more than define the claimed invention by function. That is not sufficient to satisfy the written description requirement. *See Eli Lilly*, 119 F.3d at 1568, 43 USPQ2d at 1406 ("definition by function … does not suffice to define the genus because it is only an indication of what the gene does, rather than what it is")." See Kubin at 1417.

Here, similar to Kubin, the specification fails to described what J are required with to be arranged spatially such that they are partially or completely exposed to the solvent. Accordingly, it is deemed that the specification fails to provide adequate written description for the genus of the claims and does not reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the entire scope of the claimed invention.

Rejection is maintained.

New Ground For Rejections

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-2, 6-7, 15-16, and 19-35 and 40-61 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, for variable J, the claim recites J "are selected independently of one another, such that 50% of the amino acid J are polar residues selected from the group consisting of Arg. . ." As recited, it is unclear what amino acids are defined for variable J. While 50% of the J's are disclosed are Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Lys, Orn, Pro, Ser, Thr, and Tyr, it is unclear as to the other 50% of J variables within the sequence. The claim is silent with respect to the other 50% of the J variable.

Claim 1 does not define a substitution of variable B27.

Claim 2 lacks antecedent basis. Claim 2 recites J is selected from the group consisting of Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr and Val. However, there is insufficient antecedent basis for these substitutions in claim 1 since claim 1 does not recite substitutions for J variables except Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Lys, Orn, Pro, Ser, Thr, and Tyr.

5. Claims 4-5, 8-9, 36-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of Rosen et al. teach a peptide that contains the sequence GFDERADAETLRKAMKGLGTDEESILTLLTSRSNAQRQEISAAFKTLFGRDLLDDLKSEL TGKFEKLIVALMKPS (see SEQ ID 731). However this peptide does not anticipate nor render obvious the claimed peptide since peptide of the prior art is 208 amino acids. The instant claims recite closed language and do not allow for additional amino acids on the N- and C- terminal ends.

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anish Gupta whose telephone number is (571)272-0965. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang, can normally be reached on (571) 272-0562. The fax phone number of this group is (571)-273-8300.

/Anish Gupta/
Primary Examiner, Art Unit 1654